REMARKS

Claims 1-12 are currently pending in this application. Reconsideration is respectfully requested in light of the above claim amendments and following remarks.

The Examiner rejected claims 1-4 and 7-12 under 35 U.S.C. §102(b) as being anticipated by U.S. Patent 5,740,811 to Hedberg et al. The Examiner also rejected claims 1-5 and 7-12 under 35 U.S.C. §102(e) as being anticipated by U.S. Patent 6,813,514 to Kroll et al. Applicants respectfully traverse these rejections.

Applicants' claimed invention as recited in claims 1, 11 and 12 is directed to a method and corresponding system for emulating a surface electrocardiogram (EKG) of a patient. For example independent claim 1 recites a method comprised in party by sensing a single cross-chamber signal and distinguishing portions of the cross-chamber cardiac signal corresponding to atrial signals from those corresponding to ventricular signal. The recited method then adjusts the relative amplitudes of the portions of the cross-chamber cardiac signal corresponding to atrial signals and the portions of the cross-chamber cardiac signal corresponding to ventricular signals so as to yield an emulated surface EKG. (Underlining added for emphasis only). Applicants respectfully submit that Kroll et al. do not disclose or suggest the recited claim elements.

Rather, Hedberg et al. disclose a device and method for generating a synthesized ECG wherein measured signals from two or more intracardiac and/or extracardiac electrodes are combined and a synthesized surface ECG is obtained by subjecting the measured signals to signal processing. The term "synthesized ECG" as used by Hedberg et al. is explicitly defined to mean "a signal generated from at least two in vivo signals, such as at least two IEGMs, which provides the same information as a standard surface ECG." (Hedberg et al., col. 2, lines 57-64).

Thus, Hedberg et al. utilize a minimum of two IEGMs to generate a synthesized ECG. Hedberg et al. do not therefore adjust relative portions of a single cardiac cross-chamber signal that correspond to atrial signals and portions of that same signal that correspond to ventricular signals so as to yield an emulated surface EKG as recited in the present application. Accordingly, Applicants respectfully submit that claims 1, 11 and 12 are novel and non-obvious over Hedberg et al. and are therefore allowable.

Applicants further submit that claims 2-4 and 7-10 that depend from claim 1 are allowable as is claim 1 and for additional limitations recited therein.

Similarly, the system of Kroll et al. utilizes multiple internal cardiac signals to generate emulated surface EKGs. For example, Kroll et al. convert initial internal cardiac electrical signals into a time-varying vector F(t) having <u>individual elements corresponding</u> to the <u>various pairs</u> of electrodes. The initial surface EKG signals are converted into a time-varying vector E(t) having individual elements corresponding to the surface leads. A time-varying conversion matrix M(t) of weighting factors is generated for <u>converting internal</u> cardiac <u>signals</u> into separate multiple-lead surface <u>EKG signals</u>, based on a <u>comparison</u> of the <u>initial surface EKG signals</u> and the <u>initial internal cardiac signals</u>. The time varying conversion matrix is then averaged over time to yield a fixed matrix M for use in converting newly-sensed internal cardiac signals into surface EKG signals. (Kroll et al., col. 6, line 61 – col. 7, line 5).

Thus, Kroll et al. utilizes multiple internal cardiac signals to generate emulated surface EKGs. In fact Kroll et al. explicitly teach away from using a single cardiac signal to derive information pertaining to atrial and ventricular signals. For example, Kroll et al. disclose that atrially involved signals generally give a better presentation of the P-wave than other signals as the P-wave originates in the atrium. Kroll et al. further disclose that signals that are primarily associated with the ventricles generally make better sources for emulating the QRS complex, which is primarily derived in the ventricles, than other signals. (Kroll et al., col. 20, lines 60-67).

Kroll et al. do not therefore disclose or suggest adjusting relative portions of a <u>single cardiac signal</u> that correspond to <u>atrial signals</u> and portions of that same signal that correspond to <u>ventricular signals</u> so as to yield an <u>emulated</u> surface <u>EKG</u> as recited in the present application. Accordingly, Applicants respectfully submit that claims 1, 11 and 12are novel and non-obvious over Kroll et al. and are therefore allowable. Applicants further submit that claims 2-5 and 7-10 that depend from claim 1 are allowable as is claim 1 and for additional limitations recited therein.

The Examiner rejected claims 3, 5 and 6 under 35 U.S.C. §103(a) as being unpatentable over Hedberg et al. or Kroll et al. Applicants respectfully traverse this rejection. In view of the foregoing analysis of independent claim 1 in view of Hedberg et

al. and Kroll et al., Applicants believe that the rejection of dependent claims 3, 5 and 6 under §103 is rendered moot as claims 3, 5 and 6 depend from allowable independent claim 1. Applicants therefore respectfully request that this rejection be withdrawn.
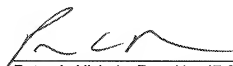
The Examiner rejected claim 1 as conflicting with claim 7 of Patent Application Serial No. 10/736,111. Applicants have cancelled claim 7 of Patent Application Serial No. 10/736,111 and respectfully request that this rejection be withdrawn.

The Examiner provisionally rejected claims 1-12 on the ground of non-statutory double patenting as being unpatentable over claims 1 and 6-16 of co-pending U.S. Patent Application Serial No. 10/736,111. Applicants will file a terminal disclaimer to obviate this rejection in the last to issue application, be it the present application or Serial No. 10/736,111.

In light of the above remarks, it is respectfully submitted that the application is in condition for allowance, and an early notice of allowance is requested.

Respectfully submitted,

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Date

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